

longitudinal direction of a recording track and/or a recording density with respect to the widthwise direction of the recording track.

3. (Amended) The recording medium as defined in claim [2] 1, wherein the relevant data [are intended to further improve the quality of the first data] complement the first data.

4. (Amended) The recording medium as defined in claim [3] 1, wherein the relevant data [comprise data based on data sampled at intermediate times between sampling times used for generating] are intended to improve the quality of the first data further.

5. (Amended) The recording medium as defined in claim [3 or 4] 1, wherein [after having been re-quantized, the first data are recorded as data having a predetermined number of bits, and the relevant data include data pertaining to a difference between the first data and at least a portion of the data which have served as the basis for re-quantizing the first data into the data having a predetermined number of bits] the relevant data comprise data based on data sampled at intermediate times between sampling times used for generating the first data.

6. (Amended) The recording medium as defined in claim [3 or 4] 1, wherein [the relevant data comprise data whose frequency components are of higher order than the frequency components of the first data] after having been re-quantized, the first data are recorded as data having a predetermined number of bits, and the relevant data are differential data and include data pertaining

to a difference between the first data and at least a portion of the data on the basis of which the first data have been re-quantized into the data having a predetermined number of bits.

7. (Amended) The recording medium as defined in claim [2] 1, wherein the relevant data [are of higher quality than the first data and can be played back solely] comprise data whose frequency components are higher frequency than the frequency components of the first data.

8. (Amended) The recording medium as defined in claim [7] 1, wherein the relevant data [correspond to data sampled at a cycle shorter than that at which the first data have been sampled] are higher in quality than the first data and can be played back solely.

9. (Amended) The recording medium as defined in claim [7 or] 8, wherein the relevant data [are wider in frequency bandwidth than the first data] correspond to data sampled at a cycle shorter than that at which the first data have been sampled.

10. (Amended) The recording medium as defined in claim [1, 2, 3, 4, 7 or] 8, wherein the relevant data are [recorded at a higher density than are the first data] wider in frequency bandwidth than the first data.

11. (Amended) A recorder for recording data on a recording medium, comprising:

a first data output device which outputs sample data, the sample data being formed by sampling information to be recorded at a given cycle and quantizing the thus-sample data into data having a predetermined number of bits;

a re-quantization device which re-quantizes the data output from the first data output device into data whose number of bits is [lower] smaller than the predetermined number of bits;

a first writing device which records, at a predetermined recording density, data on a predetermined recording layer of the recording medium on the basis of the data, which has been re-quantized by the re-quantization device;

a second data output device which [samples the information to be recorded at a cycle shorter than the predetermined cycle, quantizes the thus-sampled information into data having a predetermined number of bits, and outputs the thus-quantized information] outputs data, the data being produced by sampling the information to be recorded at a cycle shorter than the predetermined cycle and quantizing the thus-sampled information into data having a predetermined number of bits;

a separation device for dividing the data output from the second data output device into a plurality of sample data sets which have been sampled at the predetermined cycle and at different times;

a subtraction device which calculates a difference between the data output from the re-quantization device and the predetermined sample data output from the separation device; [and]

a multiplexing device which multiplexes into a single data set the data output from the subtraction device and the sample data, which are output from the separation device but differ from the predetermined sample data; and

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a second writing device for recording data on the other recording layer of the recording medium on the basis of the data, which have been multiplexed by the multiplexing device, at a recording density higher than that at which the first writing device records data.

12. (Amended) A recorder for recording data on a recording medium, comprising:

a filtering device which limits the bandwidth of information to be recorded to a predetermined frequency bandwidth;

a conversion device which samples the data output from the filtering device at a predetermined cycle and quantizes the thus-sampled data into data having a predetermined number of bits;

a diminishing device which performs a diminishing operation on the data output from the conversion device;

a re-quantization device which re-quantizes the data output from the diminishing device into data whose number of bits is [lower] smaller than the predetermined number of bits;

a first writing device which records, at a predetermined recording density, data on a predetermined recording layer of the recording medium on the basis of the data which have been re-quantized by the re-quantization device;

a separation device for dividing, into a plurality of sample data sets having been sampled at the predetermined cycle and at different times, data which are obtained by limiting the bandwidth of information to be recorded to a predetermined frequency bandwidth, sampling the information at a predetermined cycle, and quantizing the sample-information into data having a predetermined number of bits;

Accepted  
09/06/2017 12:30:09

a subtraction device which calculates a difference between the data output from the re-quantization device and the predetermined sample data output from the separation device; [and]

a multiplexing device which multiplexes into a single data set the data output from the subtraction device and the sample data, which are output from the separation device but differ from the predetermined sample data; and

a second writing device for recording data on the other recording layer of the recording medium on the basis of the data, which have been multiplexed by the multiplexing device, at a recording density higher than that at which the first writing device records data.

13. (Amended) A recorder for recording data on a recording medium, comprising:

a filtering device which limits the bandwidth of information to be recorded to a predetermined frequency bandwidth;

a conversion device which samples [the data output from the filtered device] at a predetermined cycle the data output from the filtering device and quantizes the thus-sampled data into data having a predetermined number of bits;

a diminishing device which performs a diminishing operation on the data output from the conversion device;

a re-quantization device which re-quantizes the data output from the diminishing device into data whose number of bits is smaller than the predetermined number of bits;

a first writing device which records, at a predetermined recording density data, on a predetermined recording layer of the recording medium on the basis of the data, which has been re-quantized by the re-quantization device;

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a separation device for dividing, into predetermined frequency bands, data which are obtained by limiting the bandwidth of information to be recorded to a predetermined frequency bandwidth, sampling the information at a predetermined cycle, and quantizing the sampled-information into data having a predetermined number of bits;

a subtraction device which calculates a difference between the data output from the re-quantization device and the data of a certain and output from the separation device; [and]

a multiplexing device which multiplexes into a single data set the data output from the subtraction device and the data of another frequency band output from the separation device; and

a second writing device for recording data on the other recording layer of the recording medium on the basis of the data, which have been multiplexed by the multiplexing device, at a recording density higher than that at which the first writing device records data.

14. (Amended) A recorder for recording data on a recording medium, comprising  
a first data output device which outputs sample data, the sample data being formed by sampling [at a given cycle] information to be recorded at a given cycle and quantizing the thus-sampled data into data having a predetermined number of bits;

a re-quantization device which re-quantizes the data output from the first data output device into data whose number of bits is [lower] smaller than the predetermined number of bits; [and]

a first writing device which records data on a predetermined recording layer of the recording medium on the basis of the data, which has been re-quantized by the re-quantization device, at a predetermined recording density;

a second data output device which outputs data, the data being produced by sampling, [at a cycle shorter than the predetermined cycle,] the information to be recorded at a cycle shorter than the predetermined cycle and quantizing the thus-sampled information into data having a predetermined number of bits; and

a second writing device for recording data on the other recording layer of the recording medium on the basis of the data, which have been multiplexed by the multiplexing device, at a recording density higher than <sup>that</sup> ~~at~~ at which the first writing device records data.

15. (Amended) A recorder for recording data on a recording medium, comprising;

a filtering device which limits the bandwidth of information to be recorded to a predetermined frequency bandwidth;

a conversion device which samples the data output from the filtering device at a predetermined cycle [the data output from the filtering device] and quantizes the thus-sampled data into data having a predetermined number of bits;

a diminishing device which performs a diminishing operation on the data output from the conversion device;

a re-quantization device which re-quantizes the data output from the diminishing device into data whose number of bits is smaller than the predetermined number of bits; [and]

a first writing device which records data on a predetermined recording layer of the recording medium on the basis of the data, which have been re-quantized by the re-quantization device, at a predetermined recording density; and

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